

11.

Notes on Seasonal Changes in *Creatophora cinerea*, the Wattled Starling.

LEE S. CRANDALL.

(Plate I).

The Wattled Starling (*Creatophora cinerea*), is an African member of the family Sturnidae. It has a rather wide distribution, extending from southwestern Arabia through East Africa to the Cape. An investigation of seasonal changes in males of this species is outlined in the following notes.

SEQUENCE 1.

A young specimen of the Wattled Starling (*Creatophora cinerea*) of undetermined sex, and unknown locality, was received at the New York Zoological Park on October 17, 1927.

During the entire period of observation this bird, as well as the others noted, was kept in an indoor, heated aviary from October to May, with access to an outdoor cage during the intervening months.

At the time of arrival, the head and throat were completely feathered and only the usual narrow, bare malar streaks were visible.

In the spring of 1928, the bird showed itself to be a male by an enlargement of the throat wattle, although there was no evidence of crown wattles and no loss of plumage of the head.

In the spring of 1929, the throat wattle again became enlarged, a small area of the forehead became bare and the crown wattles appeared, reaching an upright maximum of about $\frac{1}{8}$ ".

On April 19, 1930, the feathers of the forehead were dropping out. By May 9, the crown and face were black and entirely bare, except for a small tuft behind each nostril. The occipital region was bare and yellow.

The crown wattles, completely sessile, had no power of erection. The posterior wattle, attached longitudinally, measured 9 mm. at the base, expanding to a width of 11 mm. and reaching a length of 20 mm. The anterior wattle, set at an approximate right angle to the longitudinal center line, overhung the base of the bill and was overhung, in turn, by the posterior wattle. Its width at the base was 7 mm., its greatest width was 15 mm. and its greatest length 11.5 mm.

The throat wattle, along the anterior margin, measured 40 mm. when drawn out with the fingers. (As this wattle is slightly re-

tractile, an accurate measurement could not be made.) It is bifurcated at the tip, the right division measuring 9 mm., the left 12 mm.

At this time, the bird indulged in mild courtship maneuvers, tossing his head so that the crown wattles might fall on one side or other, and singing a broken and guttural song.

On August 25, the wattles were seen to be shrinking and feathers of head and face growing. This process continued until, on September 14, the wattles were entirely withdrawn and feathering was complete. However, the nodular crown wattles, normally invisible, remained discernible when the plumage was tightly compressed. Also, the malar streaks, from which the throat wattle had sprung, remained slightly more pronounced than in an immature male or a female.

During the following years, changes took place as follows:

- 1931. April 11. Feathers dropping.
May 2. Change complete.
September 26. Feathers growing.
October 17. Change complete.
- 1932. March 1. Feathers dropping.
March 22. Change complete.
September 19. Head feathering, wattles shrinking.
October 10. Change complete.
- 1933. January 4. Feathers dropping.
January 25. Change complete.
August 18. Head feathering.
September 12. Change complete.
December 1. Feathers dropping.
December 26. Change complete.
- 1934. September 12. Head feathering.
October 1. Change complete.
- 1935. February 27. Feathers dropping.
March 22. Change complete.
September 30. Head feathering.
October 22. Change complete.
December 30. Feathers dropping.
- 1936. January 13. Change complete.
January 20. Feathers re-growing, wattles shrinking.

- February 3. Head entirely re-feathered, wattles partly retracted.
 February 10. Feathers dropping again, wattles enlarging.
 February 24. Change complete, wattles fully extended, bird singing.
 September 21. Feathers growing.
 October 14. Change complete.
 December 21. Feathers dropping.
1937. January 8. Change complete.
 September 20. Feathers growing.
 October 7. Change complete.
 December 20. Feathers dropping.
1938. January 3. Change complete, wattles fully enlarged.
 February 7. Feathers re-growing, wattles shrinking.
 February 21. Feathering complete.
 March 7. Feathers dropping again, wattles enlarging.
 March 28. Change complete.
 September 12. Feathers growing.
 October 1. Change complete.
 December 19. Feathers dropping.
1939. January 6. Change complete.
 March 5. Observations ended by death of subject.
- SEQUENCE 2.
- Two Wattled Starlings which proved to be males, were received on December 14, 1934, from a dealer. The locality from which they had come was unknown. These birds were kept together, under identical conditions, during the course of the following observations. They are designated as #1 and #2. Both were fully feathered on arrival.
1935. #1. May 1. Feathers dropping.
 May 21. Change complete, crown and throat wattles well developed.
 October 21. Feathers growing, wattles shrinking.
 November 13. Change complete.
- #2. June 5. Throat wattle enlarged, feathers dropping.
 June 24. Face and crown bare, throat wattle pendant, no evidence of crown wattles.
 October 28. Feathers growing.
 November 11. Change complete.
1936. #1. April 6. Feathers dropping.
 April 26. Change complete.
 October 26. Feathers growing.
 November 13. Change complete.
- #2. April 27. Feathers dropping.
 May 16. Change complete, crown wattles minute.
 November 2. Feathers growing.
 November 20. Change complete.
1937. #1. March 15. Feathers dropping.
 March 31. Change complete.
 October 18. Feathers growing.
 November 6. Change complete.
- #2. April 12. Feathers dropping.
 April 29. Change complete, crown wattles minute, throat wattle deeply pendant.
 October 25. Feathers growing.
 November 14. Change complete.
1938. #1. February 28. Feathers dropping.
 March 16. Change complete.
 October 31. Feathers growing.
 November 18. Change complete.
- #2. March 28. Feathers dropping.
 April 18. Change complete, crown wattles minute.
 October 2. Feathers growing.
 October 21. Change complete.
1939. #1. March 6. Feathers dropping.
 March 25. Change complete.
 October 23. Feathers growing.
 November 10. Change complete.
- #2. March 20. Feathers dropping.
 April 7. Change complete, crown wattles minute.
 October 23. Feathers growing.
 November 15. Change complete.
1940. #1. February 26. Feathers dropping.
 March 15. Change complete.
 September 23. Feathers growing.
 October 9. Change complete.
- #2. April 8. Face feathers dropping.
 April 27. Change complete, crown wattles minute.
 October 28. Feathers dropping.
 November 13. Change complete.
1941. #1. March 3. Feathers dropping.
 March 23. Change complete.
 October 13. Feathers growing.
 October 29. Change complete.
- #2. April 14. Feathers dropping.
 May 4. Change complete, crown wattles minute.
 October 27. Feathers growing.
 November 14. Change complete.
1942. #1. March 9. Feathers dropping.
 March 31. Change complete.
 September 28. Feathers growing.
 October 19. Change complete.
- #2. March 30. Feathers dropping.
 April 20. Change complete, crown wattles minute.
 November 9. Feathers growing.
 November 29. Change complete.
1943. #1. February 15. Feathers dropping.
 March 8. Change complete.
- #2. March 15. Feathers dropping.
 April 7. Change complete.
- SEQUENCE 3.
- Two Wattled Starlings which appeared to be male and female, were purchased from Christoph Schulz on August 9, 1935. They were reported by Schulz to have been collected in Kenya. The male was in breeding condition at the time of arrival, with head bare and wattles well developed.

Throughout the course of observations on this pair, the female showed no plumage change and no enlargement of the bare malar streaks, at the time the male was coming into breeding condition. During October and November of each year she went through a complete body molt.

Changes in the male were noted as follows:

1935. October 22. Feathers growing.
November 13. Change complete.
1936. April 6. Feathers dropping.
April 24. Change complete, wattles well developed.
October 5. Feathers growing.
October 27. Change complete.
1937. January 18. Feathers dropping.
February 4. Change complete.
March 1. Feathers re-growing.
March 15. Face almost completely feathered, wattles shrunken.
March 22. Feathers dropping again, wattles re-enlarging.
April 2. Head entirely bare, wattles large.
October 25. Feathers growing.
November 12. Change complete.
1938. February 14. Feathers dropping.
March 3. Change complete but wattles small.
March 28. Face re-feathering.
April 11. Face almost entirely re-feathered.
April 18. Feathers dropping again.
May 5. Change complete, wattles much enlarged.
October 31. Face feathers growing.
November 19. Change complete.
1939. March 27. Feathers dropping.
April 17. Change complete.
October 9. Feathers growing.
October 30. Change complete.

1940. February 26. Feathers dropping.
March 20. Change complete.
September 23. Feathers growing.
October 10. Change complete.
1941. March 24. Feathers dropping.
April 12. Change complete.
September 29. Feathers growing.
October 18. Change complete.
1942. March 2. Feathers dropping.
March 20. Change complete.
October 5. Feathers growing.
October 23. Change complete.
1943. February 15. Feathers dropping.
March 6. Change complete.

SUMMARY.

Seasonal changes in four male and one female specimens of the Wattled Starling (*Creatophora cinerea*) have been tabulated and described. All of these birds were kept under identical conditions, as far as caging, food and temperatures were concerned. It is shown that in the males there is a seasonal loss of the plumage of the head, accompanied by enlargement of the crown and throat wattles. The single female showed no enlargement of the bare gular tracts and had only a single annual change of plumage, which took place at the period of regression in the accompanying male.

The males of Sequence 1 and Sequence 3 showed occasional "false starts," in which newly bared heads almost immediately re-feathered, quickly followed by a resumption of the bare condition. Neither of the two males described in the second series of observations showed this phenomenon.

Recorded dates of changes were established on a visual basis. However, standards of judgement were the same in all cases, so that periods indicated are properly comparable and variations would be small.

EXPLANATION OF THE PLATE.

PLATE I.

- FIG. 1. Adult ♂ Wattled Starling (Sequence 1), photographed on June 13, 1933. The head is completely bare and wattles fully developed.
- FIG. 2. The same bird, photographed on November 20, 1934. He has completed regressive changes and is in resting condition. The nodular crown wattles, not normally visible at this time, are seen because the feathers are tightly compressed. The throat wattle has receded to the lateral malar patches.